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CITY OF DURHAM | NORTH CAROLINA

Date: April 7, 2015

To: Thomas J. Bonfield – City Manager

Through: W. Bowman Ferguson – Deputy City Manager

From: Marvin G. Williams – Director of Public Works

Subject: Authorization of Intergovernmental Agreement with the U.S. Geological Survey for Operation & Maintenance of the City of Durham Rainfall and Streamflow Network FY 2016. (Agenda Item #10343)

Executive Summary

In 2008 the City entered into an intergovernmental agreement with the U.S. Geological Survey to purchase, install, operate and maintain a network of automated devices measuring rainfall and streamflow. These devices are needed to provide information necessary for the City of Durham's (City) annual report to the N.C. Division of Water Resources (DWR) regarding stormwater quality, including the response of local streams to rainfall. These devices are also used to evaluate the potential for flooding within the City. The intergovernmental agreement is negotiated and renewed regularly between the City and the U.S. Geological Survey. For the 2016 fiscal year, the intergovernmental agreement to continue operation and maintenance of the rainfall and streamflow devices is $87,600.00.

Recommendation

The Administration recommends that the City Council authorize the City Manager to execute an intergovernmental agreement with the U.S. Geological Survey for the continued operation of the automated rainfall and streamflow monitoring network at an amount not to exceed $87,600.00 for fiscal year 2016.

Background

The federally issued National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit (NPDES) issued to the City (Permit #NCS000249) requires multiple annual reports that rely on manual and automated monitoring of the stream network. These include the following:

- NPDES Program annual report,
- Total Maximum Daily Load (TMDL) Response Plan, and
- the Water Quality Monitoring and Assessment Plan.

Additional reports for Falls of the Neuse Reservoir and Jordan Lake requires information from the automated rainfall and streamflow monitoring network.

TMDL response plans require descriptions of the measures that the City has implemented and plan to be implemented, and the progress made toward meeting the TMDL targets. TMDL targets are dependent upon streamflow, which is dependent upon rainfall. TMDL implementation plans are currently required in the Third Fork Creek and

Northeast Creek watersheds. The state has identified other City watersheds that need TMDLs, including Ellerbe, Little Lick and New Hope Creeks. The Water Quality Monitoring and Assessment Program is a requirement of the NPDES permit and includes a more comprehensive evaluation of water quality within the City, including progress toward meeting goals for water quality parameters and aquatic life (i.e., stream insects or benthic macroinvertebrates).

The U.S. Geological Survey conducts water resources monitoring throughout the nation through its Cooperative Water Program. Many municipalities participate in the program in order to monitor stream flow to and from reservoirs, to assess flooding, and to evaluate water quality impacts. The City uses stream flow measurements to estimate pollutant loading, particularly nitrogen and phosphorous, from large city watersheds. The City uses simultaneous measurement of rainfall and stream flow or stream stage to evaluate potential illicit discharges to streams or to the storm water drainage system. The City also has a flood warning system for the Eno River that is implemented through the U.S. Geological Survey.

Per the agreement, the U.S. Geological Survey installed and will maintain a total of six rainfall and six stage or stream flow gauges around the city. These are listed below in Table 1.

Table 1. U.S. Geological Survey Automated Monitoring Locations and Types

Stream	General location	Type of monitoring
Ellerbe Creek	Club Boulevard	Stage, Streamflow, Rainfall
Ellerbe Creek *(a)*	Glenn Road	Stage, Streamflow
Eno River	Cole Mill Road	Stage, Rainfall
Eno River *(b)*	Roxboro Road	Rainfall
Little Lick Creek	Wake Forest Hwy	Stage, Rainfall
North Prong	Carpenter Fletcher Road	Stage
Sandy Creek	Cornwallis Road	Stage, Streamflow, Rainfall
Third Fork Creek	Highway 54	Stage, Streamflow, Rainfall

(a) This agreement allows for stream stage and flow monitoring near Glenn Road to have cost-share funding between the cities of Durham and Raleigh.
(b) Stream stage and flow monitoring near Roxboro Road is performed in cooperation with Triangle Area Water Supply Steering Committee and the U.S. Army Corps of Engineers.

Further, this agreement would allow the cities of Durham and Raleigh to cost-share funding of a stream flow gauge in lower Ellerbe Creek near Glenn Road.

Stream stage and flow information is available to any interested party and can be accessed on the internet at the U.S. Geological Survey web site under Durham County: http://waterdata.usgs.gov/nc/nwis/current/?type=flow&group_key=county_cd. Rainfall information is available on the internet at the following web address: http://waterdata.usgs.gov/nc/nwis/current/?type=precip&group_key=county_cd.

Issues/Analysis
Long-term operation of the precipitation and streamflow network will ensure that permitting, water quality, flood forecasting, and urban stream restoration needs can be served. Long-term measurements are needed to evaluate how streams respond to intense periods of rainfall, including delivery of pollutants, stream bank collapse, and flooding potential.

Alternatives
The alternative is to deny authorization to negotiate and execute intergovernmental agreements for continued operation and maintenance of the network. Capital funds spent to purchase and install equipment would be unrecoverable. The ability to complete the annual NPDES report to the state would be compromised, as would the annual reports regarding status and progress towards meeting the Falls of the Neuse Reservoir and Jordan Lakes rules. Flooding potential would be evaluated without using on-the-ground measurements, making informative and timely communication of risks to the public difficult.

Financial Impact
Operation and maintenance annual cost for FY2016 of $87,600.00 which will be paid from the Public Works Stormwater operating budget (Organization code 5500L041, Object code 728600). The U.S. Geological Survey is providing $16,800.00 of matching funds for fiscal year 2016.

SDBE Summary
Not applicable

Attachments
Price Quote from U.S. Geological Survey
Joint Funding Agreement